UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Engineering

S. H. McCrory, Chief

MONTHLY NEWS LETTER

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Beginning with the December issue the NEWS LETTER will be mailed out on the 25th of each month instead of the 20th as heretofore. News items from the field offices should be forwarded in time to reach Washington not later than the 20th of the month.

It has been customary to prepare and certify Bureau payrolls for regular appointed personnel and forward them to the Disbursing Officer in sufficient time for the checks to be drawn and mailed to reach their destinations approximately on the last day of each month. In accordance with a recent decision of the Comptroller General, this practice has been discontinued and hereafter these rolls will not be certified until the last day of the period covered by them. Consequently field salary checks will not reach their destinations until approximately the 5th to the 10th of the month, depending upon the distance from Washington.

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At the Washington office there is kept a record of all employment, whether under appointment or carried under letter of authorization. It will be appreciated, therefore, if care is taken to show the initials and name of a man exactly the same on every roll prepared. Because of varied spelling of a name from time to time, or different initials it is sometimes difficult to determine whether a name shown on a roll is the same as that shown on a previous roll, or is another person.

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Many vouchers which are submitted for payment are improperly prepared and it is necessary to correspond with the persons submitting them before they can be approved for payment. More than the usual amount of difficulty is being encountered lately with reimbursement accounts. Part of this is due to the changes made in the Standardized Government Travel Regulations, as amended, which became effective July 1. A copy of this was furnished to each of our engineers and its provisions should be followed carefully. On some of the long, poorly prepared expense accounts it has taken the auditor an undue amount of time to get the account in form either to return to the man for correction or pass for payment. As the accounting office is handling some 300 vouchers per month, it is obvious that if many improperly prepared vouchers are received there results delay to all vouchers. It would be advantageous to all concerned to take the time to check over vouchers carefully after they are prepared and make sure there are no omissions or errors.

Recently the General Accounting Office has been requiring that where Pullman tips are involved, the time of arrival at and departure from each point be shown so they can determine whether the tips are proper.

Mr. McCrory left Washington November 16 for Chicago to attend the meeting of the Association of Land Grant Colleges and Universities, and a conference called by the Secretary of Agriculture to discuss the problems of land utilization with reference to the present agricultural situation. L. A. Jones and W. W. McLaughlin will also attend this conference.

The following will attend the annual meeting of the machinery, structures, and land reclamation divisions of the A.S.A.E. to be held in Chicago November 30 to December 3: S. H. McCrory, W. W. McLaughlin, L. A. Jones, R. B. Gray, S. P. Lyle, C. K. Shedd, C. E. Ramser, E. M. Mervine and J. G. Sutton. Papers will be read by members of the Bureau on the following subjects:

Rehabilitation of Reclamation Projects now in Difficulty(Mr. Sutton)
A Report on the Work Relating to Rural Homes of the President's Conference on Home Building and Home Ownership. (Mr. McCrory).
The Ramser Silt Sampler and Its Use in Soil Erosion. (Mr. Jones).
Corn Production Machinery. (Mr. Shedd).
Development of Beet Machinery. (Mr. Mervine).
The Cost of Drainage Pumping in the Upper Mississippi Valley.(Mr. Sutton)
The Operation of Farm Machinery Over Terraces. (Mr. Ramser)
Standardization of Building Plans.(A committee report by Mr. Lyle).

George R. Boyd and S. P. Lyle recently visited Georgia and South Carolina for conferences with representatives of the State cooperating agencies on the project dealing with the development of farm lands. In Georgia Mr. Lyle conferred with Extension Director J. Phil Campbell, Prof. R. H. Driftmier and Extension Agricultural Engineer G.I.Johnston, relative to plans for agricultural engineering extension work for 1932. In South Carolina J. T. McAllister, Extension Agricultural Engineer, was conducting a farm machinery conference at which 25 district and county extension agents were present. Mr. Lyle and Mr. Boyd addressed this group on the subjects "Fitting Farm Machinery into the County Agent's Program of Work," and "Rearrangement of Farms for the Efficient Use of Machinery."

L. A. Jones, in company with H. H. Bennett of the Bureau of Chemistry and Soils, made an examination of a considerable area in southeastern Ohio and in western West Virginia with the view of locating a suitable site for a proposed soil erosion experiment station for the Appalachian Plateau region.

W. D. Ellison, as a first step in his project on maintenance of drainage ditches, in Delaware has completed arrangements for cleaning out comparable sections of ditches by hand, by the use of explosives, and with a one-half yard drag line machine. It is expected that the work will be completed this fall. He is making plans to take measurements of the flow in the ditches before and after cleaning in order that information will be available relative to the effect of such work on ditch capacities.

C. E. Ramser spent several days in the vicinity of LaCrosse, Wis., in conference with Mr. Bates of the Forest Service and P. L. Hopkins. An inspection was made of a large number of soil saving dams in that locality built under the supervision of Mr. Bates and Mr. Zeasman of the Wisconsin Extension Service. Arrangements were made for the survey of the soil erosion farm near LaCrosse, Wis., and P. L. Hopkins is at present engaged in making this survey.

Preliminary data on the Guthrie project seem to indicate that a different spacing will be required for terraces on virgin and on badly eroded land, since it was found that for two comparable terraces over twice as much soil was carried off the field by the terrace on eroded land as by the terrace on virgin land. This would tend to indicate that terraces could be spaced farther apart on virgin land. By virgin land is meant land that had never been broken prior to the beginning of these experiments. Also the effectiveness of terraces in controlling erosion is demonstrated by an experiment where the soil losses were measured from an unterraced and a terraced area. For a rain of 1.22 inches, 5.38 tons of soil per acre were lost from the unterraced area and only .21 ton of soil per acre from a level terraced area, about 27 times as much soil being lost from the unterraced as from the terraced land. For the same rain only .009 tons of soil per acre was eroded from a wooded watershed.
H.S. Riesbol and H. E. Bergschneider spent a day on a cooperative terracing

demonstration with the County Agent and built three terraces with a combined length of 1,600 feet with a one-way plow with 26-inch disks. Although the ground was very hard and dry the plow did very satisfactory work and it is expected that additional data on terrace building with this plow will be obtained when the ground is in better condition.

H.O. Hill has completed the installation of Parshall flumes and silt samplers on a level terrace at Temple, Texas. Level terraces are meeting with much favor in many sections of the country and it is important that data on run-off and soil losses be obtained on all projects for comparison with similar losses from graded terraces.

Measurements have been made of the depth of water in the terrace channels on the Hays project where the slope of the land varies from .2 to 2 per cent and results indicate that comparatively low terraces can be used on such lands. It is believed that a height of 9 inches is sufficient to hold most of the rainfall. R. R. Drake reports that in the case of subsoiling terraced and unterraced land it was found that subsoiling increased the yields of wheat from 1.29 to2.29 bushels per acre. This increased yield was attributed principally to moisture conservation.

R. W. Baird reports from observations on the Tyler project that the outstanding difficulty in operating, planting, and cultivating machinery parallel to terraces is the tendency of the machine to move down the side slopes of the terrace. This required operating the machine at a slight angle so that the covering devices on the planter do not follow directly behind the furrow openers. This results in the improper covering of the seed. With the cultivator equipment it is difficult to prevent the wheels of the tractor from running on a cotton row and at the same time prevent the cultivator shovels from plowing out the cotton. He suggests that the planter and cultivator be hinged in the center or at least be flexible enough so that the two rows, one on each side of the terrace, would be planted and cultivated together. This would obviate the necessity of operating the machine on the steep slopes of the terrace.

A. T. Holman reports that on the Bethany project, in farming across terraces, only 12 inches high, the tops were cut down considerably and maintenance work was required on some of the terraces before the crops were removed in the fall. This would indicate that a height greater than 12 inches, even though the terrace is all built from the upper side, is required for satisfactory results.

P. C. McGrew reports that some important changes in the design of machinery operating on the steep slopes of the Pullman farm will be required for satisfactory operation in crossing terraces. Observations thus far seem to indicate that it may be necessary to conduct all farm operations parallel to the terraces, particularly upon the steeper slopes.

The cross section and location survey of all of the terraces on the Clarinda project have been completed and R. A. Norton has been devoting part of his time to the analyses of terrace construction cost data. He reports that the average cost of building terraces on the Clarinda project was $3.90 per acre.

W. W. McLaughlin met Mr. McCrory at Denver October 18, after a trip through Arizona and New Mexico, and spent two days with him at Fort Collins. On his return to Berkeley, he inspected the Bear Bay project and had a conference at Logan, Utah. In reference to the flow of gas from a well that was being bored on the Bear Bay project, which was described in the NEWS LETTER for August, Mr. McLaughlin reports that the well is still giving off gas in about the same quantity as originally. A new well is being put down 100 feet or so from the old well, and after tapping the gas pocket, it is hoped the old well may be closed off and the gas put under control.

At a meeting of the State Engineers of the seventeen Western States, held at Sacramento on October 28-30, Mr. McLaughlin discussed the work of the Division of Irrigation and its relation to the work of the State engineers.

H. F. Blaney supervised the preliminary work on a field study, requested by the State Engineer of California, to determine the amount of water supply resulting from absorption of rainfall on the valley floors in Ventura County, Calif. In company with Mr. Jamison, Associate Hydraulic Engineer of the State Division of Water Resources, he made a survey of the areas to be studied. Typical soil types in the principal valleys of the county were explored. Sixteen general rainfall penetration stations were established and soil samples were taken at 1-foot intervals to a depth of 17 feet in the walnut, apricot, bean and uncultivated plots. The citrus plots were sampled to a depth of 6 feet only. Several soil moisture laboratories were visited and arrangements were made to obtain data which have been collected on citrus and walnut plots during the last few years.

Mr. Blaney attended a conference called by Prof. Frank Adams of the University of California, of the County Farm Advisors and representatives of the State Engineer's office for determining methods to be used in the proposed study "Permissible Cost of Irrigation Water in Southern California." Mr. Blaney also attended the semi-annual meeting of the California Economic Research Council October 23, and gave a review of his bulletin on "Cost of Irrigation Water in California," - State Department of Public Works Bulletin No. 36.

M. R. Lewis completed specifications for the proposed buildings on the Medford pear irrigation station. He made a trip to Medford October 28 and 29 in company with Director Schoenfeld and Acting Director Besse of the Experiment Station for a conference with the local committee which has been arranging for the financing of the building program. Mr. Lewis also supervised the drilling of a deep well for

irrigation on a farm near Canby, Oregon. The expense of drilling this well is being paid for from a revolving fund for the development of irrigation in the Willamette Valley. It seems probable now that part or all of the cost will be borne by the fund as an experimental loss, as very little water-yielding material has been encountered to a depth of 215 feet. To that depth the well is 12 inches in diameter, but the diameter will be reduced and the drilling carried to 300 feet.

J. H. McCormick is making preparations to begin studies of consumptive use of water at Bard, Calif., in cooperation with the U. S. Bureau of Plant Industry. On October 10, in company with Messrs. Blaney and Taylor, he made a trip to Bard, where they met Mr. McLaughlin and had a conference with Mr. Noble, Superintendent of the Experiment Station. Several plots were inspected and the soil sampled to a depth of 9 feet. On October 19 Mr. McCormick made a second trip to Bard and made a more detailed examination of the soils, as a guide in selection of plots. Mr. Hastings of the Bureau of Plant Industry and Mr. Noble selected 15 plots on the basis of comparative yields. Mr. Taylor later joined Mr. McCormick and they made further examination of the plots and took 230 samples for moisture determination and 36 larger samples for wilting point and moisture equivalent determination. This work revealed that soil conditions on several of the plots selected varied widely, and it was suggested that these be eliminated and that one entire rotation series where the soil strata was more uniform be substituted. Mr. Hastings took these data to Washington for further discussion.

Leslie Bowen spent two weeks at Mitchell, Nebraska, in becoming familiar with that part of the work of the Scottsbluff Experiment Station, maintained by the Bureau of Plant Industry, upon which we will conduct cooperative irrigation studies. Completing this work, he was transferred to Burns, Oregon, to assist Mr. Jessup in service work for the Bureau of Biological Survey.

R. L. Parshall is devoting most of his time to the study of the riffle sand trap. Recently he has been requested to cooperate with the State Agricultural College and the State School of Mines in attempting to adapt the sand trap to milling purposes in metalliferous mining. The tailings from these mills are conveyed by water and this water is afterward used for irrigation purposes. The object of the sand trap is to rid the water of its load of mill tailings. The problem in connection with the pollution of Clear Creek, Colorado, by means of mill tailings is giving the mining industry much concern, and on various occasions recently the officials of the Chain-of-Mines at Central City have visited our laboratories to discuss their important problem. Mr. Parshall has constructed a small model sand separator which has been tried out at the mill at Central City and found to do what was expected; that is, if the effluent stream from the mill could be passed through three separations, it is believed that it

could be separated in a ratio of about 95 per cent of sand and 5 per cent of slimes in one stream, and about 95 per cent slimes and 5 per cent sand in the second stream. Electrical methods have been investigated as a means of precipitating slimes and in the use of small equipment at the hydraulic laboratory, using both direct and alternating current, and it has been found possible to readily precipitate these slimes as carried in the waters of Clear Creek.

A. Lincoln Fellows has presented two papers recently as radio talks over the Pacific Coast hook-up of the National Broadcasting system. On November 3 he read a paper by M. R. Lewis on "Important Things the Farmer Should Know Before Installing the Pumping Plant;" and on November 10, a paper by Colin A. Taylor on "How Much Winter Rainfall Will the Soil Hold?"

R. B. Gray arrived at Washington, D.C. November 4, to take up his duties with the Division of Mechanical Equipment. En route he stopped at Columbus, Ohio and conferred with Prof. C. O. Reed relative to corn borer and other machinery investigations, and with Prof. G. W. McCuen relative to power machinery. Professor McCuen was was trying out his recently developed electric dynamometer designed to measure power requirements of belt-driven machinery, including combines and their component parts.

The Toledo agricultural engineers attended the Annual Corn Harvesting Machinery Field Day at Tippecanoe City, Ohio on November 4, where they observed a number of different makes of pickers in operation. S. W. McBirney conducted a demonstration of corn borer control machinery consisting of a low-cutting corn binder, sled-type stalk shaver, and special four-bar side delivery rake. It was estimated that 15,000 people were in attendance at the meeting.

Messrs. Irons and Young have continued with the program of plowing demonstrations in Massachusetts and Connecticut. During the week of November 16, Mr. Irons is to make an inspection trip to Accomac County, Virginia, where an isolated corn borer infestation has been found, with a view to making recommendations as to the best methods for a cleanup.

Walter Redit, for some time assisting W. M. Hurst on the rice harvesting and drying project at Beaumont, Texas, reported for duty at the corn borer station at Toledo, Ohio, October 19.

Messrs. Merrill and McBirney conferred with Plant Quarantine and Control Administration officials at Springfield, Ohio, November 11, relative to the corn borer machinery to be exhibited at the International Livestock Show at Chicago.

W. M. Hurst returned November 9 from a trip to Mississippi, where he experimented with grain combines in harvesting soy beans. In this region the rank growth of the beans makes combining with the ordinary machine difficult, if not impossible.

G. A. Cumings left November 16 for Chicago where he is to present a report on fertilizer machinery investigations before the Joint Committee on Fertilizers, November 18. En route he stopped at Columbus to confer with Prof. C. O. Reed of Ohio State University concerning the fertilizer machinery investigations under way in that State.

E. M. Dieffenbach, Assistant Mechanical Engineer, reported for duty at Albany, Ga. October 16, to take charge of the investigations designed to improve spraying equipment used for insect pest and fungus disease control of citrus, pecan, peach, apple and other orchard trees.

Claude K. Shedd has been continuing the mechanical corn picker tests in cooperation with the Iowa Station at Ames. He finds a considerable difference in performance of the various machines under test.

Investigations of the various methods of harvesting sugar beets conducted by E. M. Mervine, in cooperation with machinery manufacturers and others, bring out some very ingenious schemes. The machine which seems to give the most promise lifts the beets by the top and then tops them. He reports the beet harvest in Colorado as practically over although many beets ordinarily are still in the ground at Thanksgiving and sometimes even at Christmas.

M.A.R. Kelley is now at Brook Hill Farm, Genesee Depot, Wisconsin, to continue the cooperative project begun last year on the relation of sudden changes in stable temperature to milk production. The selection of uniform lots of cows has been completed. This preliminary work was necessary to permit valid comparison of milk production in the five stables, each of which will differ from the others in temperature conditions.

A. H. Senner is making preparations for a study of steam sterilization of greenhouse soil. He is now completing a manuscript on "Greenhouse Heating."

J. R. McCalmont is at Toledo, Ohio, making a study of pressures in an experimental corn crib. Measurements of deformation of steel members in floor and walls will be taken as filling of the crib progresses, and corresponding pressures computed. Experiments will be made with widths of crib of 8, 10 and 12 feet. Maximum heights of filling will be 24 feet for all widths.

M. C. Betts reports that working drawings are being made for a poultry feeding and fattening station at the Beltsville farm. Drawings and specifications are almost completed of a large equipment depot to be erected at Vancouver, Washington, for the Bureau of Public Roads. Drawings have been made for metal rabbit hutches for the Bureau of Biological Survey.

T. A. H. Miller spent two weeks recently at Big Spring, Texas in connection with the erection of a beef cattle feeding plant of the Dry Land Farming Experiment Station. He then visited the regions adjacent to El Paso, Texas and Las Cruces, New Mexico, investigating adobe construction. He expects to use the data thus obtained in a proposed bulletin.